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NOTICES OF NEW BOOKS.

Geisteswissenschaften und Naturwissenschaften: Untersuchungen zur Theorie und Einteilung der Realwissenschaften. Von ERICH BECHER. München und Leipzig, Duncker & Humblot, 1921.—pp. xii, 335.

This work is rather a discussion of the general principles or theory of a classification of the sciences than an attempt to classify them in detail. It is therefore a study in the theory of knowledge and does not deal with the traditional divisions recognized in curricula and in scientific literature, except as these may serve as heuristic guides. At the same time, as compared with such a classification as that of Rickert or Windelband, it shows a tendency to keep close to the recognized lines of division. Professor Becher conceives the problem in a less rigidly formal manner. Instead of trying to carry through a classification on a single principle, he tries to show that the subject may be approached from several points of view and that the results so obtained converge toward a single conclusion. A work so conceived perhaps lacks something of formal exactness but on the whole it gains more than it loses. Little is gained by pretending that results are more exact than the subject matter permits. Any classification of the sciences will encounter difficulties and the results are rather an approximation than a definitive conclusion. Professor Becher has taken care not only to criticise classifications that differ from his own but also to point out that they are in all cases founded upon really significant aspects of the subject.

Professor Becher has not undertaken a complete classification of the sciences. As the title indicates, his classification applies only to sciences which have a subject matter composed of "reals" (*Realwissenschaften*). He thus recognizes the traditional two-fold division into empirical sciences on the one hand and rational or ideal sciences (*Idealwissenschaften*) on the other. The latter class is mainly represented by pure mathematics, though it is not identified with this exclusively. This class of sciences deals not with " Sein " but with " Sosein." The author refers to this two-fold division only briefly in his introduction and then proceeds to a division of sciences of " reals."

His thesis is that for this class of sciences the old division into physical and mental is still the most satisfactory. This division corresponds to that between natural sciences (*Naturwissenschaften*) and the sciences of civilization or cultur (*Geistes-* or *Kulturwissenschaften*). His argument follows three lines, the purpose being, as was said above, to show that all these lines converge upon the same conclusion. In any science, he maintains, there are three main factors: first, a subject matter composed of existing objects which are to be explained; second, methods of investigation, proof, and verification by which explanations are built up; and third, general principles of knowledge, categories or assumptions, without which explanation would be impossible. These three factors, however, are not independent of one another, or indeed always easy to distinguish. Methods, for example, must be appropriate to subject matter; objects dictate within limits the means by which they can be explained. Conversely the systematic application of a method often brings to light aspects of objects or relations between them which were quite unsuspected. Nevertheless the three factors may conveniently be distinguished and a classification of the sciences ought to be made with all three in view. Accordingly the author starts from the following definition: "A science is an objectively ordered body of problems and of true or probable judgments, together with the investigations and verifications attaching to them and uniting them, referring to the same object or the same group of actually related objects" (p. 6). His book falls into three main divisions dealing respectively with the classification of the sciences from the point of view of subject matter, of method, and of the principles of knowledge.

The first division reaffirms the proposition already laid down in the introduction, that the division of subject matter into physical and mental, if not wholly satisfactory, is at least less open to objection than the criticisms brought against it. The author canvasses the objections brought on the one hand by materialists who object to the recognition of mental objects and on the other hand by the positivists who deny a knowledge of an extra-mental reality. But the most serious difficulty that he has to meet is that which has always attended the dualistic hypothesis, the fact that large and important subject matters, such for example as that of physiology, cannot readily be divided into physical and mental and that in any case both types of reality seem to belong equally to a single subject matter. Like others who have met this difficulty, the author does not get much beyond the recognition that some physical sciences apparently have to allow for mental factors, just as all mental sciences would apparently have to allow for physical factors. While this is obviously a compromise with principle, he is probably right in holding that the broad distinction of physical and mental is too useful to abandon and in any case not worse than other broad distinctions.

The second division, dealing with method, is naturally devoted in large part to an analysis and criticism of the Windelband-Rickert hypothesis of a classification of the sciences into generalizing or nomothetic and historical or individualizing (ideographic) sciences. This part of the book is useful because it supplies references and a guide to the really large literature which has grown up from the discussion of this hypothesis. In principle Professor Becher's chief objection is that Rickert's argument is purely methodological, to the exclusion of a consideration of subject matter on the one hand and of general epistemological principles on the other; it assumes a distinction between the three factors in science which does not exist. Hence it is formal. The development of these criticisms is the most effective part of the book. Professor Becher shows that an effort to carry through Rickert's distinction would imply a division of all existing disciplines which would not leave either history or science. For on the one hand the interest of the generalizing sciences in individual existences is not so incidental as Rickert assumes; the individual is not merely something which the scientific law has to escape from. And on the other hand it is by no means true that history is interested solely in individuals. It is forced to deal with masses; many of its objects are general rather than singular; and in practice history shows no disinclination to generalize if it can. In short Professor Becher urges, quite rightly, that the operations of generalizing and of conceiving individuality are closely related parts of the explanatory process; they are by no means so sharply distinguishable as Rickert's hypothesis assumes. He is quite prepared to agree, however, that the hypothesis has its use as a principle of subdivision; certain natural sciences are relatively general and others relatively descriptive or ideographic, and the same is true of the mental sciences. Political history is more concerned with outstanding personalities than economic history.

On the other hand, Professor Becher's criticism of the place of valuation in history (or relation to value, as Rickert calls it) is not equally happy. At all events the hypothesis which he offers in place of this part of Rickert's theory,—that the principle of selection used in history is "magnitude of effect,"—is too vague. Without a reference to values there is no historical measure of the magnitude of effect. No doubt the French Revolution is an epoch-making historical event because of the magnitude of the changes which it inaugurated in European civilization, but these changes are changes in value. There is no measure of them in terms of any sort of physical or mental energy.

The third division of the book, on the principles of knowledge, begins as might be expected with the distinction of objective perception and introspection, on which the distinction of physical and mental science is based. It goes on to a discussion of objective reference and the categories of substance, cause, and teleology, and their use in the two kinds of science, and closes with a brief discussion of evolution. The final chapter of the book deals briefly with metaphysics, which the author conceives as the ultimate science of reality, not included in either of his two main classes.

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